

What kind of organization is a wiki?

Dimensions of decentralization in peer production

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July 7, 2020

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Faculty Associate



Community
Data Science
Collective

2020-07-07

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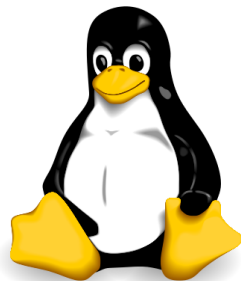


My plan involves reflecting on four studies I've been involved in over the last 4 years.

Each study sought to apply insights drawn from organizational research to wikis (i.e., communities that are or are similar to Wikipedia). In all four studies, we found that interventions associated with increased organizational performance in traditional organizations had **no effect**, or effects that are **opposite in sign**, to what we expected going in.

I want to use this talk to think with all of you about what these results can teach us about new models of cooperative production online and, more speculatively, what these results might reveal about dimensions that decentralization can occur within organizations in general.

New modes of **collective production** of public knowledge goods made possible by new communication technologies. (Benkler 2003, 2006)



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- What kind of organization is a wiki?
 - └ Commons-based Peer Production
 - └ Peer Production

As you all know from the chapter I shared, “peer production” is a term coined by Yochai Benkler (pictured here, the one w/ the beard) describes a new form of decentralized production made possible by the Internet.

Archetypes of peer production are Linux and WP.

New modes of **collective production** of public knowledge goods made possible by new communication technologies. (Benkler 2003, 2006)



Coase's Penguin, or, Linux and *The Nature of the Firm*

Yochai Benkler[†]

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What kind of organization is a wiki?
└ Commons-based Peer Production

This is the first page of the article that provided the first attempt at an organizational explanation “peer production.” The “penguin” is Linux. Coase refers to “The Ronald.”

As you can likely infer from the title, Benkler relied heavily on transaction costs economics to explain peer production’s emergence in the late ’90s and early ’00s.

Coase's Penguin, or,
Linux and *The Nature of the Firm*

Yochai Benkler[†]

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Peer production decentralizes production through porous organizational boundaries that facilitate mass participation.

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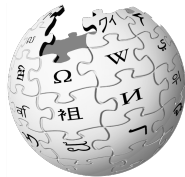
What kind of organization is a wiki?
└ Commons-based Peer Production

Peer production decentralizes production through porous organizational boundaries that facilitate mass participation.

Peer production is invoked in conversations about decentralization because it is seen as decentralizing production.

Benkler's basic argument was that new information technology has driven the transaction costs associated with collective action so low as to allow the mass aggregation of many small contributions from diversely (and often only slightly) motivated individuals. The result, B argues, is a new form of collaborative production that lies outside of markets and firms.

To this day, explanations based on low transaction costs associated with contributing has been the dominant theoretical approach to explaining peer production.



wikia



StackExchange



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What kind of organization is a wiki?
└ Commons-based Peer Production



As you'll know from the reading I circulated, Wikipedia and Linux two are just the tip of the peer production iceberg.

- Thousands of other communities doing a range of things. Many millions of participants worldwide.
- Peer production produces critical digital infrastructure that we all use every day. All our supercomputers. Almost all the servers that run the Internet. Most of our phones. Collaborative filtering that helps us decide where to put our attention.



Community
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Collective

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What kind of organization is a wiki?
└ Community Data Science Collective



This a what a group photo looks in the COVID-19 era. This is about 2/3 of the research collective that I share with Aaron Shaw (who is here) and a number of other faculty and graduate students.



Community
Data Science
Collective

- Study peer production projects **at an organization level** (e.g., organization-level interventions and outcomes).
- Test **theory from organization science** using detailed digital trace data recorded in peer production projects.
- **Develop new organizational theory** based on what we find.

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What kind of organization is a wiki?

└ Community Data Science Collective



- Study peer production projects **at an organization level** (e.g., organization-level interventions and outcomes).
- Test **theory from organization science** using detailed digital trace data recorded in peer production projects.
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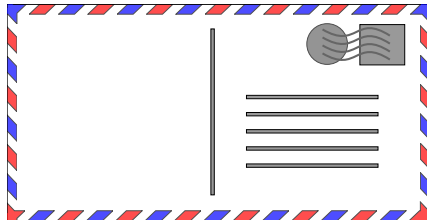
Although we are just part of a large scholarly community studying PP (mostly in computing and information science) our group is “different” in that we hang out with you all.

The CDSC “brand” is basically to:

- Start with organizational theory drawn from the study of firms and non-profits.
- Build large datasets of behavior within and across online organizations.
- Deploy and test the effectiveness of organizational interventions (often experimentally or quasi-experimentally).
- Attempt to develop new organizational theories based on what we find

Often things turn out the way we expected. Sometimes we can use detailed digital trace data to test things in new ways and gain new insights into old problems.

Four Research Postcards



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What kind of organization is a wiki?

└ Four Research Postcards

Four Research Postcards



Today, I want to talk about four projects we've done where things worked out differently.

What I'm going to do is quickly introduce four surprising results—1 minute per paper.

My plea: To the extent possible, worry less about the specifics of our methodology or identification strategy and treat results from these studies as “stylized facts” for the purposes of the more theory-driven reflection that I'm introducing these results as grist for.

The Wikipedia Adventure

Field Evaluation of an Interactive Tutorial for New Users

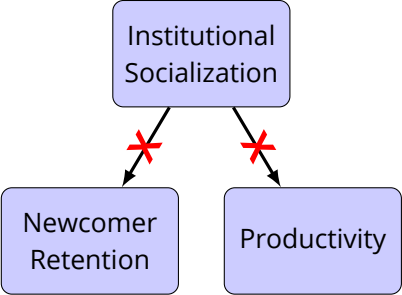


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What kind of organization is a wiki?

└ Four Research Postcards

└ The Wikipedia Adventure Field Evaluation of an Interactive Tutorial for New Users



Postcard #1 (I'll refer to it as “The Tutorial”): Most peer production projects rely heavily, if not exclusively, on forms of deeply individualized forms of newcomer socialization where people learn on the job.

In a project led by Sneha Narayan who is now at Carleton, we evaluated a field experiment conducted in Wikipedia where thousands of newcomers were invited to participate in a structured online tutorial that reflects a type of institutionalized socialization inspired by—and shown to be effective in—traditional organizations.

We found... Wikipedia users who were invited to and/or engaged with the tutorial learned a lot about how to Wikipedia and claimed to have enjoyed it.

However, treated users *did not* go on to stick around longer or to edit Wikipedia more than users who were never invited or who didn't use it.



All Talk

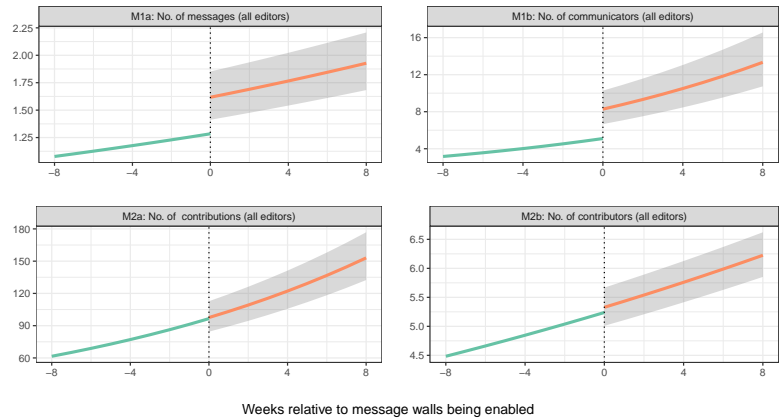
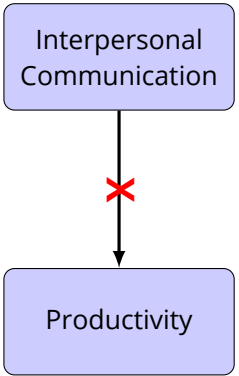
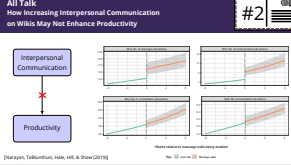
How Increasing Interpersonal Communication on Wikis May Not Enhance Productivity



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What kind of organization is a wiki?
└ Four Research Postcards

└ All Talk How Increasing Interpersonal Communication on Wikis May Not Enhance Productivity



Postcard #2 (“Interpersonal Communication”)

In a second project also led by Sneha, we considered the roll-out of a design feature that make interpersonal communication much easier in about 500 Wikipedia-like projects. This was motivated by the fact there’s a bunch of research in a range of organizational research fields that suggests that increased interpersonal communication is associated with increased cooperation, higher performance, and higher productivity.

We found:

- As expected, the new feature led to substantial increases in interpersonal communication [the top row].
- The new feature **did not** correspond to any increases in organizational-level productivity or the number of people engaged in contributing.

Communication Networks Do Not Explain the Growth or Survival of Early-Stage Peer Production Projects

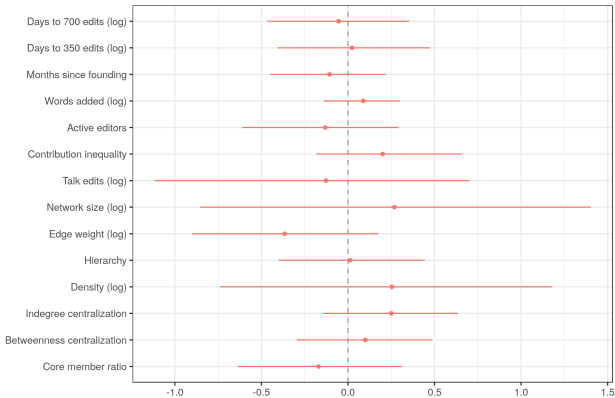
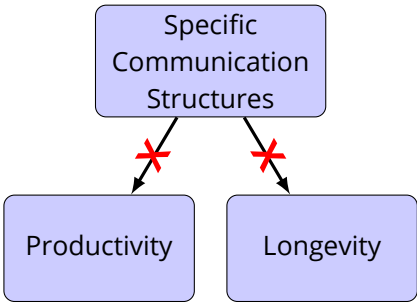
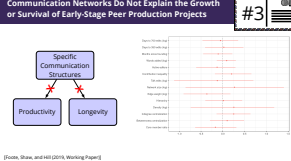


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What kind of organization is a wiki?

Four Research Postcards

Communication Networks Do Not Explain the Growth or Survival of Early-Stage Peer Production Projects



Postcard #3 (“Networks”) is a project led by Jeremy Foote (now at Purdue) that looked for correlations between the structure of communication networks of wikis when they were the size of traditional firm-based teams and wiki-level measures of wiki and longevity.

A bunch of research in organizational communication suggests that if you map communication networks (like through email) certain kinds of networks (like dense ones were more people talk to each other) are associated with higher performance.

We found...

- Plenty of variation in communication network structure (similar to studies of teams).
- Basically **no relationship at all** between a long list of communication network structures and outcomes related to performance or longevity in traditional firms.

The graph is coefficient estimates for our community longevity survival model but the important point here is that nothing work.

Hidden Costs of Requiring Accounts

Quasi-Experimental Evidence From Peer Production

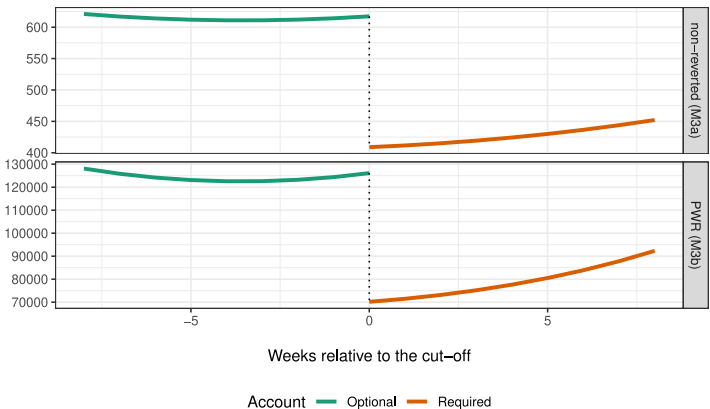
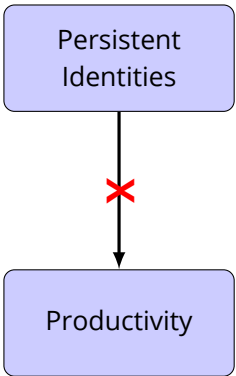
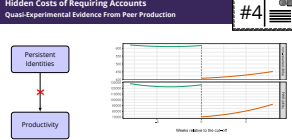


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Four Research Postcards

Hidden Costs of Requiring Accounts Quasi-Experimental Evidence From Peer Production



Postcard #4 (“Accounts”) is a collaborative project with Aaron Shaw that estimated the effect of a new requirement to create accounts on group-level outcomes of productivity. There’s a bunch of work in organizational psychology that suggested (to us) that the ability to create relationships with other users would benefits (if not require) a persistent identity and that a mandate for persistent in an increase in group level productivity.

What we found was a large (20-40%) decrease in group-level productive activity associated with the 9introduction of the new requirement. Maybe not shocking given that the requirement is also a cost.

We found that this occurred among people with accounts present before! This is consistent with a story where these contributions were, indirectly, being prompted by activity from other without accounts whose contributions were deterred.

The graphs show two different measures of productivity and quality (basically the amount of good stuff coming in) and it drops substantially. That’s all you need to know.

Four explanations

..and what they suggest about dimensions of decentralization

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- What kind of organization is a wiki?
 - Four explanations
 - ..and what they suggest about dimensions of decentralization

Four explanations
..and what they suggest about
dimensions of decentralization

In all four cases, I want to suggest that these results might be explained if we consider that peer production is decentralizing more than just the ability to contribute through lowered transaction costs.

I want to walk though four sets of meta-explanation that connect, in various ways, to different dimensions of decentralization.

A. "Exit" is *extremely* cheap



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What kind of organization is a wiki?

- └ Four explanations
 - └ A. Low-cost exit
 - └ A. "Exit" is *extremely* cheap

The reality is that peer production projects are often very difficult to join.
They are, however, *extremely easy to leave*.

A. "Exit" is extremely cheap



[WMC / Public Domain]

Our surprising results might be explained if we assume that exit is **much easier in peer production** than in traditional organizations.

- [Postcard #1] Newcomer socialization \nrightarrow Productivity
- [Postcard #4] Account Requirement \nrightarrow Productivity

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What kind of organization is a wiki?

- └ Four explanations
 - └ A. Low-cost exit

Our surprising results might be explained if we assume that exit is **much easier in peer production** than in traditional organizations.

- [Postcard #1] Newcomer socialization \nrightarrow Productivity
- [Postcard #4] Account Requirement \nrightarrow Productivity

Low-cost exist seems like a partial explanation for our surprising in several ways:

PC1: An explanation for the ineffectiveness of a tutorial is that excellent organizational socialization doesn't matter if folks are going to "peace out" the first time encounters something demotivating. And newcomers experience demotivating things all the time .

PC4: An explanation for while the account requirement leads to such a massive decrease in productivity is commitment builds slowly over time and very small early-stage barriers can deter a massive amount of good stuff.

In peer production, low-cost “exit” reflects decentralization of decisions on *who* participates.

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What kind of organization is a wiki?

└ Four explanations

└ A. Low-cost exit

In peer production, low-cost “exit” reflects decentralization of decisions on *who* participates.

This is a relatively subtle, but I think important, wrinkle on the original peer production story.

The argument here is that “production” is decentralized in peer production in large part because decisions about non-production or non-participation are.

B. Self-assignment into tasks

		Task Selection	
		Centralized	Distributed
Task Execution	Centralized	Individual Work Firms	Broadcast Search Innovation Contests Online Brainstorming
	Distributed	Crowdsourcing Citizen Science	Peer Production

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- What kind of organization is a wiki?
- Four explanations
 - A. Self-assignment into tasks
 - B. Self-assignment into tasks

		Task Selection	
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Task Execution	Centralized	Individual Work Firms	Broadcast Search Innovation Contests Online Brainstorming
	Distributed	Crowdsourcing Citizen Science	Peer Production

[Adapted from Benkler (2013) and Benkler et al. (2015)]

To the extent that Benkler has changed his thinking about peer production over the last 20 years, it's in has been through a series of attempts he has taken distinguish the PP organizational form from crowdsourcing or citizen science.

This is a visualization of an argument we rehearse in the chapter I shared that is draw, in part, of a chapter that Benkler wrote before.

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What kind of organization is a wiki?

└ Four explanations

└ A. Self-assignment into tasks

Our results might be explained by the fact that task selection occurs through self-assignment in peer production:

- [Postcard #2] Interpersonal Communication \nrightarrow Productivity
- [Postcard #3] Communication Networks \nrightarrow Productivity

Our results might be explained by the fact that task selection occurs through self-assignment in peer production:

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- [Postcard #3] Communication Networks \nrightarrow Productivity

Decentralized task-selection might be a partial explanation for both PC1 and PC3 (both of which conclude that communication isn't associated with performance) in the sense that there's little benefit from being able to tell others what do if they are going to do what they want in any case.

In peer production, self-assignment into tasks decentralizes decisions about *what* participation entails.

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What kind of organization is a wiki?

└ Four explanations

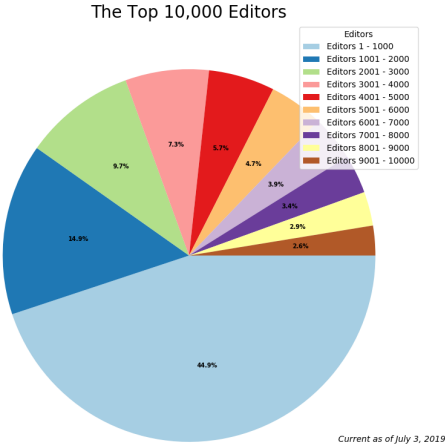
└ A. Self-assignment into tasks

In peer production, self-assignment into tasks decentralizes decisions about *what* participation entails.

This reflects a distinct and independent, if also somewhat subtle, way in which decentralization occurs peer production. The 2x2 suggests that they aren't linked in the way that I think early worked assumed that it is.

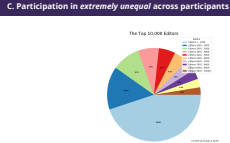
I think the greatest impact of peer production may be through projects in the lower quadrant where firms are able to learn from peer production to harness the power of mass collaboration for different goals.

C. Participation in *extremely unequal* across participants



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- What kind of organization is a wiki?
- Four explanations
 - C. Participation inequality
 - C. Participation in *extremely unequal* across participants



Our results might be explained by the fact that the distribution of contributions across contributors is extremely unequal in peer production.

- [Postcard #1] Socialization \nrightarrow Productivity
- [Postcard #2] Interpersonal Communication \nrightarrow Productivity

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What kind of organization is a wiki?

- └ Four explanations
 - └ C. Participation inequality

Participation inequality may be a partial explanation in the sense that:

- [Postcard #1 Tutorial] If activity is driven by rare superusers, average effects of interventions might not matter.
- [Postcard #2 Interpersonal] Interventions that affect new (non-core) users might not move the needle.

Our results might be explained by the fact that the distribution of contributions across contributors is extremely unequal in peer production.

- [Postcard #1] Socialization \nrightarrow Productivity
- [Postcard #2] Interpersonal Communication \nrightarrow Productivity

In peer production, unequal participation reflects decentralization of decisions around *how much to participate*.

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What kind of organization is a wiki?

└ Four explanations

└ C. Participation inequality

In peer production, unequal participation reflects decentralization of decisions around *how much to participate*.

This reflects a third distinct dimension of decentralization.

D. Coordination is frequently *stigmergic*



[Mehmet Karatay]

19/22

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What kind of organization is a wiki?

- └ Four explanations
 - └ D. Stigmergic coordination
 - └ D. Coordination is frequently *stigmergic*

D. Coordination is frequently *stigmergic*



[Mehmet Karatay]

Findings about the lack of importance of communication are may be particularly depressing for those of us in communication departments but raise an interesting question.

We can see coordination happening—just not through folks talking.

This concept of stigmergy from biology that describes coordination through a changing environment is a useful frame. An example of stigmergy is ants leaving pheromone trails in ways that make subsequent behavior by other ants possible.

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What kind of organization is a wiki?

- └ Four explanations
 - └ D. Stigmergic coordination

Our results might be explained if we assume that exit is coordination in peer production happens through stigmergy.

- [Postcard #2] Interpersonal communication \rightarrow Productivity
- [Postcard #3] Communication network structures \rightarrow Productivity
- [Postcard #4 Accounts] Account requirement \rightarrow decreased activity among unaffected users

Our results might be explained if we assume that exit is coordination in peer production happens through stigmergy.

- [Postcard #2] Interpersonal communication \nrightarrow Productivity
- [Postcard #3] Communication network structures \nrightarrow Productivity
- [Postcard #4 Accounts] Account requirement \rightarrow decreased activity among unaffected users

Stigmergy is a partial explanation in that:

- for PC2 and PC3 the finding is that communication doesn't matter. Folks are definitely coordinating somehow, and artifact based coordination seems like one possibility.
- [PC4] is a different story. In this case, it's evidence that low-quality contributions by newcomers can catalyze high quality contributions. Andrea Gorbatai has some work that suggest that vandalism can play a regulating role.

**In peer production, stigmergic coordination
decentralizes *the sites and means of coordination*.**

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What kind of organization is a wiki?

└ Four explanations

└ D. Stigmergic coordination

In peer production, stigmergic coordination
decentralizes *the sites and means of coordination*.

A fourth and final sense in which production in peer production is decentralized.

Dimensions of decentralization in peer production

- [A. Low-cost exit] Deciding **who** participates (leaders → participants)
- [B. Task selection] Deciding **what** participation entails (leaders → participants)
- [C. Participation inequality] Deciding **how much** to participate (leaders → participants)
- [D. Stigmergy] Sites and modes for **coordinate** (direct communication → stigmergy)

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What kind of organization is a wiki?

- └ Four explanations
 - └ D. Stigmergic coordination
 - └ Dimensions of decentralization in peer production

Dimensions of decentralization in peer production

- [A. Low-cost exit] Deciding **who** participates (leaders → participants)
- [B. Task selection] Deciding **what** participation entails (leaders → participants)
- [C. Participation inequality] Deciding **how much** to participate (leaders → participants)
- [D. Stigmergy] Sites and modes for **coordinate** (direct communication → stigmergy)

Here's those dimension on one slide. In the first three cases, we see decentralization of activity from leaders to participants. Stigmergy is different but I think also reflects a shift of coordination work in a place where it is more accessible.

I do want to suggest that this is all very tentative. You're the first people to see this.

The charge given to Mai and I was to talk about radical decentralization, and you can see that I've taken that charge seriously.

I will say that the more I've worked on this talk, the more I feel like I've run up against the limits of a centralized/decentralized framing.

- e.g., Inequality in participation is a deep form of centralization of activity across a range of people.

Why does it matter?

Although peer production is extreme along each of these dimension, none are unique.

- Peer production offers a laboratory to study each dynamic.
- Evidence scope condition for organizational interventions.
- Opportunities to learn from emergent routines/structures in peer production (e.g., models for stigmergic coordination)

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What kind of organization is a wiki?

- └ Four explanations
 - └ D. Stigmergic coordination
 - └ Why does it matter?

I want to end by reflecting on the fact that peer production is extreme along each of these dimension, none are unique features of peer production and each dimension reflects a a more general source of “organization levers.”

- I do hope I’ve made the case that peer production offers a laboratory to study organizational dynamics.
- Hopefully, the postcards have shown some evidence that doing so can give us insight into scope condition for organizational interventions.
- Finally, I hope that I’ve given you a sense of how thinking about peer production can provide opportunities to learn about broader issues and opportunities in organizational research. I look forward to continuing that conversation here.

Why does it matter?

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 - Evidence scope condition for organizational interventions.
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Thanks!

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What kind of organization is a wiki?

└ Four explanations

└ D. Stigmergic coordination

Thanks!